

Ideas in Mathematics
Math 170, Spring 2018
Questions about Midterm 2

1. **In terms of induction proofs, you said we should have a sentence concluding the proof. What should I write?** Answer: For example, you could write "Therefore the statement holds for $k+1$." after showing that $k+1$ works in the induction step.
2. **Are the extra problems, especially the graph theory ones, significantly harder than what we should expect on the exam?** Answer: Yes. They are closer to homework problems.
3. **Do I need to memorize the table of the number and degree of the vertices, faces and edges of the platonic solids?** Answer: NO. You should know what the Platonic solids are, e.g. how many there are, and what they look like. I will only ask for things that you could "see" if you had the solids in front of you (or things you can conclude from that information). For example, you would then know that only one of them has faces of degree 5 (question on the practice midterm). But you wouldn't know the number of edges of the icosahedron.
4. **I know that if a vertex has an odd degree, then there is no Euler's Cycle. But is it also true the other way around? Meaning that is it true that if all the vertices have degree even, then the graph must have Euler's Cycle? (Assuming connected graphs).** Answer: Yes. Euler's Theorem goes in both directions. It says that if a connected graph has an Euler cycle then all vertices have even degree (this is the part we showed), but it also says that if all vertices have even degree, there is an Euler cycle (this is harder to show and we didn't do it in class).
5. **You mentioned in class that we do not need to know how to draw the 5 platonic solids, however in the last question of the extra problems, there are two questions asking to draw the dual graphs and draw the planar graphs of the five platonic solids. Should we know how to draw them or not?** Answer: You do not need to know/memorize the graphs associated to the Platonic solids. But you should know in general how to draw the graph associated to a polyhedron. Most of the graphs of the Platonic solids are too complicated for an exam. But drawing them is good practice.